"ITS Focus Report on System Architecture": An Overview

This white paper provides a brief overview of the report titled "ITS Focus Task Force on System Architecture Report", dated May 1997. The report was prepared by a special task force of the United Kingdom's ITS Focus organization. This task force was established to study the US National ITS Architecture and recommend an approach for addressing ITS architecture in the UK.

Architecture is important to UK ITS objectives

The report strongly supports the key role an architecture plays in meeting broad objectives in system integration. It warns of independent systems, costly retrofit of systems when a defacto architecture is realized, and curtailed international competitiveness as costs of not addressing ITS architecture early. The successful GSM digital cellular network in Europe is offered as an example of how early establishment of an architecture and standards opened broad markets served by different independent service providers.

The task force performed a substantial review of the US Architecture with particular focus on the relevance of the US Architecture to the UK. In general, the report's findings on the US architecture are very positive with the caveat that the operational requirements of UK transport systems are somewhat unique and require different architectural treatment. To quote the report:

> *The National ITS Architecture therefore provides a good basis for ITS standerisation work. It is comprehensive and logical, and in principle, it could be used as a starting point for much domestic and European standards work. However it would need to be tailored to match UK requirements.*

UK ITS requirements are unique

The unique UK requirements that are identified in the report include:

- The report anticipates greater emphasis on DSRC applications in the UK. The greater population density and smaller geographic size of the UK may make DSRC a more attractive solution for a broader range of services. For example, the report asserts that beacon-based route guidance will prove desirable in the near term in the UK before being replaced by systems using wide area communications.

- The report expects that the UK will have a more integrated set of wireless communications bearers than the US. This may allow a more prescriptive communications architecture for the UK that integrates GSM and forthcoming Digital Audio Broadcasting (DAB) standards per the report.

- The complexities associated with a deregulated transit environment in the UK would require increased architectural emphasis on transit integration in the UK.

- The firm requirement to coordinate closely with CEN standards activities and many current UK initiatives (e.g., Urban Traffic Management and Control (UTMC), Regional Traffic Control Centre (RTCC), National Driver Information System (NADICS), and National Motorway Control System version 2 (NMCS2)) would influence the UK architecture.

The US architecture is very good but...

While the report generally endorses the National ITS Architecture and US DOTs associated initiatives, a few comments are made in the context of this positive message. In a chapter devoted to architecture review, the US architecture is critiqued in the following ways:

- The architecture is described as too permissive. As an example, the report correctly identifies that the US architecture allows public, private, and public-private Information Service Providers (ISPs). In general, the absence of policy in the architecture receives a mixed review in the report.

- In contrast, the architecture's treatment of DSRC is presented as unnecessarily restrictive. Several of the gaps that the report identifies (e.g., reporting of variable speed limits) are actually supported by the National Architecture. Other identified omissions (e.g., route guidance using beacons) are real.

- The report identifies specific areas where the on-going communications/technology revolution is already beginning to date the architecture products. Specific examples that are identified include advances associated with the Internet (e.g., JAVA) and object oriented strategies including Common Object Request Broker Architecture (CORBA).

These comments, and others, are addressed by the US architecture team in a second white paper that provides a critique of the same ITS Focus report.

The US Architecture is a good starting point for the UK.

While it raises these issues, the report finds that the US Architecture structure is comprehensive and sound and will serve very well as a starting point for a UK architecture. The report recommends an "Enterprise Model" process to begin the application of the US Architecture for the UK. This process first identifies the overall objectives of the system to include:

- The activities that take place

- The roles that people are required to play

- The interactions that take place, between the organizations, the system, and the environment

This description, though it uses different words, has a clear parallel with US DOTs own evolving architecture guidance which begins with an operational concept that addresses the same basic issues.

The UK should sponsor its ITS architecture effort.

The report ultimately promotes the idea of ITS Focus developing a government-sponsored architecture program. This may have pre-ordained that the result of the report was that a system architecture is very important, but the US architecture won't quite do the job for the UK. Given this vested interest, the report nonetheless seems well thought out and generally accurate in its review of the US program.